



सत्यमेव जयते



Amrita for Life

Tinospora Cordifolia (Giloy)




NATIONAL MEDICINAL PLANTS BOARD

Ministry of AYUSH, Government of India



Tinospora Cordifolia (Giloy)



AMRITA
for
LIFE



Contents

i	MESSAGE	i
ii	ACKNOWLEDGMENT	iii
iii	ACRONYMS AND ABBREVIATIONS	v
1.	INTRODUCTION	2
2.	DISTRIBUTION	7
3.	VERNACULAR NAMES	8
4.	SPECIES OF TINOSPORA	9
5.	PHARMACOGNOSTICAL DESCRIPTION	10
6.	ACTIONS/ PROPERTIES	11
7.	RESEARCH ASPECTS/ACTIVITIES	12
8.	TRADE AND COMMERCE	15
9.	SUBSTITUTES AND ADULTERANTS	16
10.	PROPAGATION AND CULTIVATION	16
11.	AMRITA IN AYURVEDA	18
12.	AMRITA IN UNANI SYSTEM OF MEDICINE	22
13.	AMRITA IN SIDDHA SYSTEM OF MEDICINE	23
14.	AMRITA IN HOMOEOPATHY	24
	BIBLIOGRAPHY	25

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Ministry of AYUSH
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National Medicinal Plants Board

Message

In Ayurvedic medicine, *T. cordifolia* (Willd.) Miers ex Hook. F. & Thoms is known as “*Guduchi*” and is considered to be one of the most divine herbs. It is distributed throughout tropical Indian subcontinent and China, ascending to an altitude of 300 m. In Hindi, the plant is commonly known as Giloya, which is a Hindu mythological term that refers to the heavenly elixir that have saved celestial beings from old age and kept them eternally young. *Guduchi* is widely used in veterinary folk medicine/ayurvedic system of medicine for its general tonic, antiperiodic, anti-spasmodic, anti-inflammatory, antiarthritic, anti-allergic and anti-diabetic properties. The plant is used in *ayurvedic*, “*Rasayanas*” to improve the immune system and the body resistance against infections hence the plant is a natural immune booster. The root of this plant is known for its antistress, anti-leprotic and anti-malarial activities.

Tinospora is supposed to be the nectar of god Indra, that's why, it is considered as *Amrita* (pious liquid or nectar). It is used in the treatment and cure of many diseases and known as panacea for all the diseases and disorders. Giloy is useful in the promotion and restoration of health and make you ready for holistic well-being. It is helpful in stress and anxiety and having immunomodulatory effects. Besides, it has many unknown health benefits and uses; it is also very useful in Dengue because it helps to increase the count of platelets.

As per much importance of the plant, it is selected for this year campaign. NMPB will promote cultivation, plantation, conservation, research, value addition awareness programme etc on the *Tinospora* plant throughout the year by this campaign. To aware the local people, the Team of NMPB has prepared a booklet on *Tinospora* species. This booklet having all the information about the *Tinospora* like how to cultivate, research aspects, conservation of plant, therapeutic values, common names in regional languages etc.

I deeply appreciate the much needed efforts of the NMPB team to bring out the publication for welfare of general masses, researchers stakeholder, traders, collectors and farmers.

Dr. (Prof.) Tanuja Manoj Nesari
Chief Executive Officer



If the wisdom is herbal,
many ailments are curable

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Acknowledgement

Nature has blessed us with an array of amazing medicinal plants. These plants can be found right outside our doorstep from the spunky, dominating dandelion to the handsome stalks of stinging nettle.

Plants can be used in many ways to improve overall health and wellness. Plants can give us the power to take control of our own health, so that we may be the best, most vibrant versions of ourselves!

As we know cultivation and conservation of medicinal plants are the main objectives of schemes of National Medicinal Plants Board (NMPB) which offers opportunities for crop diversification and income generation to the farmers. NMPB gives emphasis on establishment of herbal garden in homes to promote the uses of medicinal plants for primary health care at household level. NMPB has already supported the respective state governments in in-situ and ex-situ conservation and cultivation of medicinal plants along with a large-scale plantation of native medicinal plants. For this year campaign NMPB has selected a very important Medicinal Plant- *Tinospora cordifolia* used in many Ayurvedic formulations.

NMPB has prepared this booklet for awareness and utility of general masses regarding how to cultivate *Tinospora cordifolia* growing in the local surroundings and how it can be used in their day to day health needs. *Tinospora* is a natural Immune booster. This publication is primarily based on various ayurvedic research papers and literature. Some information on *Tinospora* pertaining to their morphological characters, therapeutical uses and taxonomical details have also been adopted from the published literatures of Ayurvedic, Homoeopathic, Unani sciences, Indian Formularies/Pharmacopeias, Wealth of India etc.

National Medicinal Plants Board extends its gratitude to the Ministry of AYUSH for providing their valuable inputs on the draft text improving its contents and utility. The contribution made by NMPBs officials particularly of Dr. Padma Kumar, Assistant Advisor (Botany), Dr. Naresh Kumar Kumawat, Research Officer (Ayu.) for his technical inputs and overall support in publication of this booklet is immensely acknowledged. This publication would

not have been possible without the untiring efforts of Dr. Dushyant Kumar Kishore, Research Officer (Ayu.) and Dr. Jeetendra Kumar, Research Officer (MPs/Agro) who went through several revisions and up-gradation of the information received from various institutions.

7 also gratefully acknowledge Sh. Ashok Kumar, Finance and Administrative Officer, Dr. Sunil Dutt, Research Officer (MPs/Agro), Dr. Harjeet Singh, Research Officer (Pharmacology), Dr. Kavita Tyagi, Senior Consultant (NAM), Dr. Santosh Kumar Sharma, Consultant (JFMC) Dr. Sweta Chhangani, Consultant (Collection /Comp. of Raw Material Data), Dr Vinita Pandey, consultant (Eco Task Force), Dr. Surender Korenga, Consultant (Ex-situ Conservation) and Anil Kumar Consultant (Hindi), for their efforts and all other Officers/Staff of NMPB, Department of AYUSH and to everyone who has been directly or indirectly involved in bringing out this publication.

7 express thanks to Sh. Balram Chauhan, Project Associate and Sh. Lalit Raghaw, Project Associate for formatting and designing of Booklet. I express my thanks to Sh. Surender Chauhan, SOA and Sh. Amit Puri, DEO to completing typological work of the manuscript.



(Padmapriya Balakrishnan)
Deputy Chief Executive Officer

Acronyms and Abbreviations

A.D.	Anno Domini
API	Ayurvedic Pharmacopoeia of India
Arab.	Arabic
AYUSH	Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy
Beng.	Bengali
CCRAS	Central Council for Research in Ayurvedic Sciences
ENG.	English
FYM	Farm Yard Manure
Guj.	Gujarati
HPI	Homoeopathic Pharmacopoeia of India
Kash.	Kashmiri
Mal.	Malayalam
Mar.	Marathi
NMPB	National Medicinal Plants Board
Punj.	Punjabi
SPI	Siddha Pharmacopoeia of India
Tam.	Tamil
Tel.	Telugu
TLC	Thin Layer Chromatography
UPI	Unani Pharmacopoeia of India
WHO	World Health Organization

Guduchi : The Amrita for Life



Giloy Plant



Ripe Fruit of Giloy Plant

BOTANICAL NAME : *Tinospora cordifolia (Willd.)*
Miers. ex Hook. f. & Th.

FAMILY : *Menispermaceae*

1. INTRODUCTION

India is home to diverse range of medicinal plants which have been the mainstay of traditional health care practices across all societies for centuries. Medicinal plants form the major resource base of our indigenous health care tradition or systems across the globe.

India also has very strong traditional health care practices that are represented by the Indian system of medicine like Ayurveda, Siddha, Unani and Homoeopathy. A very significant population is having the medicinal plants in primary health care as well as source of medicine, so it can be mentioned that the medicinal plants are an integral part of people's life. Also, the plant species which generally used as health promoters are categorized as '**Health Plants**'.

The universal health burden of bacterial or bacterial resistance due to the indiscriminate and prudent use of antibiotics, which on the way produce antibiotic resistance, the number of deaths due to the failure of antibiotic treatment is becoming more nowadays. Global consumption of antibiotics is more than 70 billion doses per year. The WHO's statistics also shows that about 490,000 people have been infected with multi-drug-resistant tuberculosis in year 2016. It is estimated that due to multi-drug-resistance, by 2050, there is a possibility of more than 10 million deaths per year, more than the number of cancer-related deaths (8.2 million per year) in the same period. Early research estimates that due to antimicrobial resistance, the financial burden can reach 100 trillion dollars annually by the year 2050. Figures are large but one thing is clear that antibiotic resistance or anti-microbial-resistance is one of the major problems of 21st century public health concerns.

In such a case, it is very necessary to find effective and reliable options to manage the elimination of multi-drug-resistant pathogens and the malignant fatal infections caused by them. Antibiotic-resistance is a problem across the world, but in India it is more alarming as there is wide indiscriminate use of antibiotics. Statistics of the year 2010 show that India was the world's largest consumer of antibiotics for human health and is still today. In India, there is more consumption due to the poor health indicators of public health, increasing personal income and availability of cheaper antibiotics without any prescription.

India is one of the major country affected by viral diseases like dengue, Chikungunya etc. Presently, about 40% of the World's population is at risk of these diseases and there are 50-100 million cases reported every year. An estimated 50000 people with severe dengue require hospitalization every year and about 2.5 % of those affected die. Almost 1.3 million suspected Chikungunya fever cases were reported in India. For viral and other infections, there is almost no treatment available and whatever is there have a lot of side effects. In this condition, there is need of hour to introduce a preventive and health promotive substance measure for public. For this purpose, '*Amrita*' or *Tinospora cordifolia*, a commonly available and well defined in the ancient texts and well researched medicinal plant in the context of immune-modulator can be

established as preventive and health promotive measure. Also, the recent studies shows that the chemical constituents of *Amrita/Guduchi* (*T. cordifolia*) are having self-antimicrobial properties which are helpful in breaking antibiotic-resistance so, it can be considered as alternate of modern antibiotics and called as “**Herbal Antibiotics**”.

GUDUCHI:

Amrita (Tinospora cordifolia) is one of the most highly valued and common herb in Indian system of medicine. It has a rich history in the Indian sub-continent where it has been used and written about for thousands of years. It is known universally as “*Guduchi* or *Giloe*” (one which protects the body). The Sanskrit and Hindi name *Amrita* is derived from ancient Hindu scriptures where *Amrit* was used to bring the dead back to life and keep away from growing ill and old. *Bhav-prakash Nighantu* provides mythological description about the origin of *Guduchi/Amrita* from the drops of Divine nectar (*Amrit*) which was sprinkled on the dead bodies of the monkeys to make them alive *who* were died during the battle between *Rama* and *Ravan*. Few drops of the nectar from the bodies of the monkeys fell on the ground and from them, *Guduchi* sprouted.



As per classical Ayurvedic texts word *Amrita* is referred as:

“अमृताव ली-अमृतबद-त या.....”

(The creeping plant that endows life by destroying disease)

“गुडूची-गुड रक्षणे” । (निघण्टु आदर्श)

(It provides protection against many diseases). Many references of *Guduchi* are found in the ancient texts in context of promotion of health and treatment of diseases. In order to identify the *Guduchi* plant, *Nighantu* provides clarifications on its identity and also provides its synonyms, properties, actions, indications in various diseases.

“गुडूची मधुपर्णी स्यादमृताऽमृतवल्लरी ।
छिन्ना छिन्नरुहा छिन्नोद्भवा वत्सादनीति च ॥६॥
जीवन्ती तन्तिका सोमा सोमवल्ली च कुण्डली ।
चक्रलक्षणिका धीरा विशल्या च रसायनी ।
चन्द्रहासा वयस्था च मण्डली देवनिर्मिता ॥७॥
गुडूची कटुका तिक्ता स्वादुपाका रसायनी ।
संग्राहिणी कषायोष्णा लघ्वी बल्याऽग्निदीपनी ।
दोषत्रयामृतृदाहमेहकासांश्च पाण्डुताम् ॥८॥
कामलाकुष्ठवातास्रज्वरकुमिवमीनहरेत् ।
प्रमेहश्रवासकासार्षः कृच्छ्रहृद्दोग्धातनुत् ॥९॥”

The above said *Shloka* from *Bhav-prakash Nighantu* provides the description of *Guduchi* in terms of its synonyms like *Maduparni*, *Amruta*, *Amrtavallari*, *Chinnaruha*, *Chinnodabava*, *Vatsadani*, *Jivanti*, *Tantrika*, *Soma*, *Kundali*, *Chakralakshinika* etc. and its properties i.e. *Guduchi* has *Tikta* (bitter) & *Katu* (Pungent) *Rasa*, *Madhur Vipaka*, *Sangrahini*, *Ushna Veerya*, *Laghu*, *Balya*, *Agni-deepana*. It alleviates all three *Doshas* (*Tridosha-shamaka*) and *Aam*. It cures thirst, burning sensation, Urinary diseases including glycosuria, cough, anaemia, jaundice, skin diseases *vata-rakta*, fever, worm infestation and vomitings. It also cures twenty types of urinary diseases, dyspnea, cough, hemorrhoids, difficulty in micturition, cardiac problems and *vata* diseases. *Guduchi/Amrita* is also mentioned as ***Rasayana***.

RASAYANA:

One among the eight branches of *Ayurveda* is *Rasayana*. It augments the concept and applications of *Rasayana* i.e. which roots out morbidity, destructive of diseases, checks disease process, corrects the various body channels, restores the nourishing and promote the health. *Rasayana* not only alleviates or cures diseases but also maintains the intactness of body components and enhances the life expectancy.

स्वस्थस्योर्जस्करं यत्तु तद्वृष्यं तद्रसायनम् ॥
दीर्घमायुः समृतिं मेधामारोग्यं तरुणं वयः।
प्रभावर्णस्वरौर्दा देहेन्द्रियबलं परम् ॥
वाक्सिद्धिं प्रणतिं कान्तिं लभते ना रसायनात् ।
लाभोपायो हि शस्तानां रसादीनां रसायनम् ॥
(वरक संहिता)



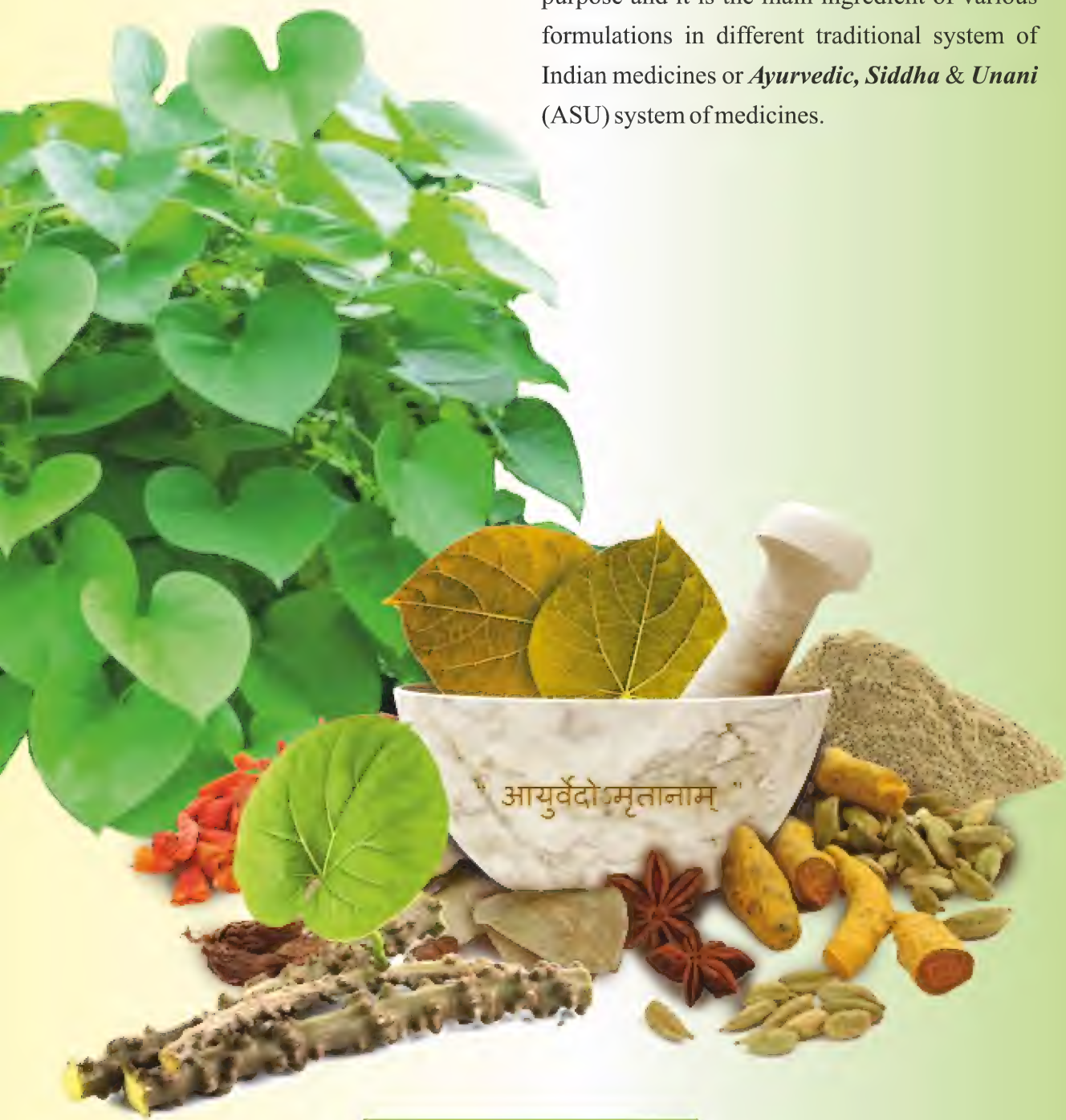
Flowers of Giloy Plant

Rasayana means the way to attain excellent *Rasa* i.e., to attain longevity, memory, intelligence, youthful age, excellence of lusture, complexion and voice, optimum strength of physique and sense organs, successful words, respect, ability and brilliance along with freedom from ailments.

RASAYANA



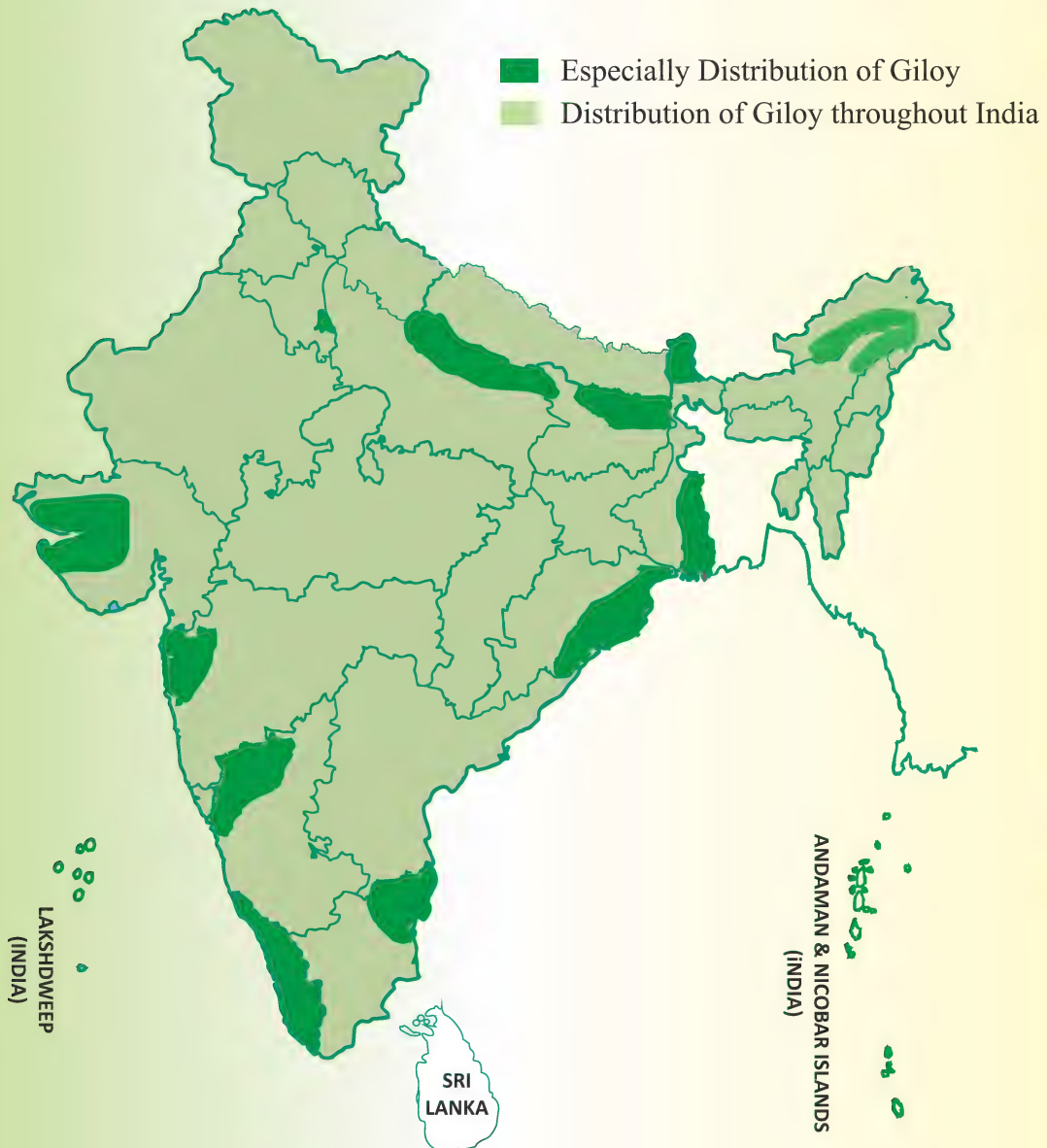
The stem part of the plant is used for medicinal purpose and it is the main ingredient of various formulations in different traditional system of Indian medicines or *Ayurvedic, Siddha & Unani* (ASU) system of medicines.



Ayurvedic usage of Giloy Plant

2. DISTRIBUTION

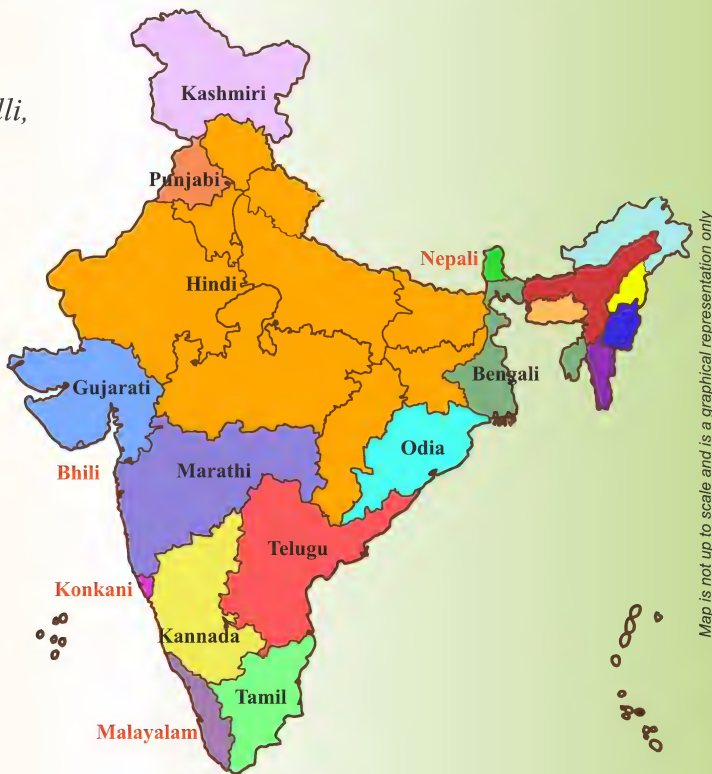
It is found throughout India especially tropical area, mainly in state of India such as Arunachal Pradesh, Assam, Bihar, Delhi, Gujarat, Goa, Karnataka, Kerala, Maharashtra, Odisha, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal.



Map is not up to scale and is a graphical representation only

3. VERNACULAR NAMES

Eng.	- Gulancha tinospora, Indian tinospora, Moon creeper, Heart leaved moon seed, bile killer, Tinospora
Hindi	- <i>Gulancha, Giloy, Amrita, Gulneha, Gulbel, Guloh, Gurcha.</i>
Beng.	- <i>Golancha, Giloe, Gulancha</i>
Guj.	- <i>Gulvel, Galo</i>
Mal.	- <i>Amrutavalli, Chitamruthu, Chitamrith, Amrtu, Amritavalli, Amrthu, Siddamirth</i>
Mar.	- <i>Gulvel, Amrita, Gulvel, Amritavalli</i>
Punj.	- <i>Gilo, Gilo- gulanch, Garham, Palo</i>
Tam.	- <i>Amrutavalli, Chintilikkoti, Chindil, Seendal, Seendil kodi, Silam, Kunali</i>
Tel.	- <i>Tippatige, Dussiramu Thippateega, Amruta</i>
Kannada	- <i>Amaradaballi, Amrutaballi, Amrutaballi, Agniballi</i>
Sanskrit	- <i>Jivantika, Vatsahani, Guduchi, Amritha druma</i>
Arab.	- <i>Gilo</i>
Assam	- <i>Siddhilata, Amarlata, Shaguni-lata, Geloi, Hoguni-lot, Amar-lata</i>
Kash.	- <i>Amrita, Gilo</i>
Oriya	- <i>Gulochi, Gulancha</i>
Urdu	- <i>Gurch, Guluncha</i>
Manipuri	- <i>Ningthou Khongli</i>



Classical Names:

Guduchi, Madhuparni, Amrita, Amritavallari, Chhinna, Chhinnaruha, Chinnodbhava, Vatasadani, Tantrika, Kundalini, Chakralakshanika, Somavalli, Dhira, Vishalya, Rasayani, Chandrasaha, Vayastha, Mandali, Devanirmitta.

4. SPECIES OF TINOSPORA

The 40 species are distributed in tropical Africa, South -East Asia, Indo Malaya region and Australia of which 3 species have been recorded from India. According to Indian medicinal plant, the following species are used medicinally.

- *T. bakis* Miers - In Senegal
- *T. Cordifolia* Miers - In Indo- China
- *T. crisa* Miers - In Indo- China
- *T. malabarika* Miers - In Indo- China
- *T. rumphii* Boerl- Java

Out of these only three species of *Tinospora* found in India namely *Tinospora cordifolia*, *Tinospora sinensis* and *Tinospora crisa*. They are mostly found in tropical and subtropical area of India.

***Tinospora Cordifolia* Miers Syn. *Menispermum cordifolium* (willd):**

- A glabrous, climbing, succulent shrub. Bark grey, corky, lenticelled, exfoliating in papery peelings. Aerial roots arise from nodal scars of branches. Leaves membranous, broadly-cordate, 8-12 cm long, about as broad, usually with broad sinuses at base, acute at apex, 6-7 nerved; petioles 3.5-9.0 cm long swollen at base. Flowers yellow in slender racemes drooping from the axils of the leaves or naked stem. Stem and branches are speckled with white vertical lenticels. Male flowers clustered. Female flowers usually solitary. Drupes crimson-coloured when ripe, ovoid, succulent with glutinous pulp. Seeds reniform.



5. PHARMACOGNOSTICAL DESCRIPTION

Drug occurs in pieces of varying thickness ranging from 0.6-5 cm in diameter, young stems green with smooth surfaces and swelling at nodes, older ones show a light brown surface marked with warty protuberances due to circular lenticels; transversely smoothened surface shows a radial structure with conspicuous medullary rays traversing porous tissues, taste bitter.

- **Stem:** The stem of *T. cordifolia* is rather succulent with long filiform. Fleshy aerial roots from the branches with a thick, soft, warted bark.
- **Bark:** The bark is creamy white to grey, deeply left spirally, the space in between being spotted with large rosette like lenticels.
- **Leaf:** The leaves are membranous and cordate at the base. Leaves alternate, on long flexuose petioles, spreading 2-4 inches long, roundish oval, entire, acute at the apex, quite smooth and thin. The leaves have bitter taste and an indistinct odour, when the leaves seen in bulk, they look intensely green. Mature leaves show yellowish to green colour.
- **Flower:** The flowers are small and yellow or greenish in colour. In auxiliary and terminal racemes or racemose panicles, the male flowers are clustered and female are usually solitary.
- **Fruits:** 3 or less usually less by abortion shortly, stalked, subglobose drupes. The drupes are ovoid, glossy, succulent, red and pea sized. Flowers grow during the summer and Fruits during the winter and fruits are fleshy.



6. ACTIONS/ PROPERTIES

Actions:

The stem is bitter, astringent, sweet, thermogenic, anodyne, anthelmintic, alterant, antiperiodic, antispasmodic, antiinflammatory, antipyretic, antiemetic, digestive, carminative, appetiser, stomachic, constipating, cardi tonic, depurative, haematinic, expectorant, aphrodisiac, rejuvenating, galacto-purifier and tonic.

Uses:

It is useful in burning sensation, hyperdipsia, helminthiasis, dyspepsia, vomiting, flatulence, acid gastritis, jaundice, haemorrhoids, menometrorrhagia, intermittent fevers, viral fevers, inflammations, gout, cardiac debility, skin diseases, leprosy, erysipelas, anaemia, cough, asthma, general debility, seminal weakness, urinary disorders, splenomegaly, rheumatoid arthritis, filaria, eye diseases. The whole plant, well ground, is applied on fractures and skin disorders.



Giloy Plant Over Neem Tree



Leaves of Giloy Plant

Chemical Constituents

Tinosporine, tinosporon, tinosporic acid, tinosporol, tinosporide, tinosporidine, columbin, chasmanthin, palmarin, berberine, giloin, giloinisin, 1,2-substituted pyrrolidine, a diterpenoid furanolactone, 18-norclerodanediterpene-O-glucoside, aryltetrahydrofuranolignan, octacosanol, nonacosan-15-one and -sitosterol, cordifolide, unosporin, heptacosanol, cordifol, cordifolon, magnoflorine, tembetarine, cardiofoliosides A & B, phenolic lignan- 3-(4-dihydroxy-3-methoxybenzyl)-4-(4-hydroxy-3-methoxybenzyl) –tetrahydrofuran, arabinogalactan (various parts).

7. RESEARCH ASPECTS/ACTIVITIES

Many research works have been carried out on *T. cordifolia* with different activities i.e. adaptogenic, antineoplastic, anti diabetic, anti-bacterial, miscellaneous. But here some research works have been mentioned which are related to this study.

Immunomodulating Activity:

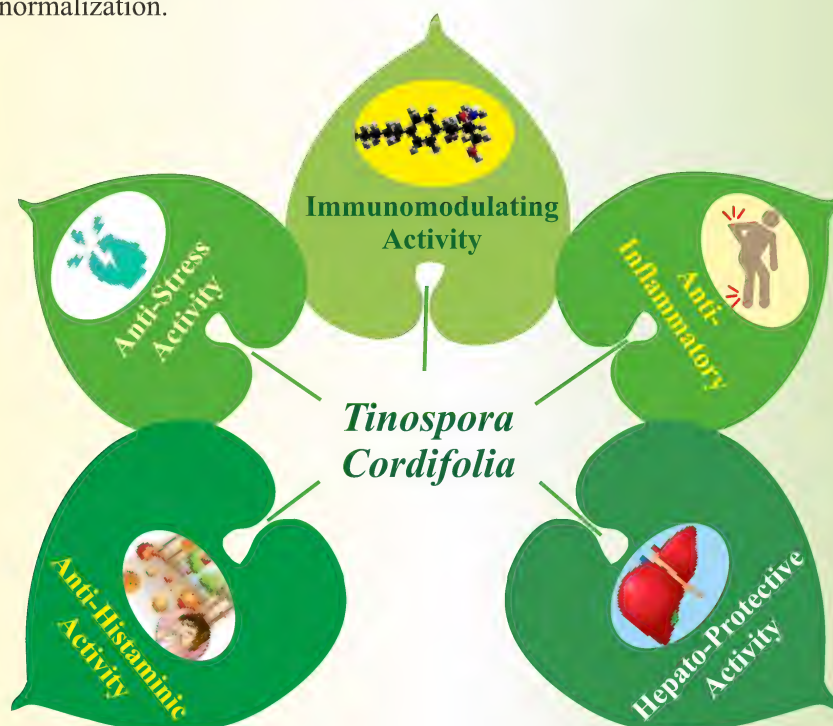
- Syringin, Cordiol, Cordioside and cordifoliside were found to possess immunopotentiating activity.
Tinospora cordifolia was found to have immunomodulating activity.

Anti-inflammatory Activity:

- The aqueous extract of *Tinospora cordifolia* showed significant anti inflammatory activity in rats against acute and chronic type of inflammation induced by carrageenin and the activity resembles that of NSAIDS.
- Singh et al. have shown that the aqueous suspension of the alcoholic extract of the stem of *T. cordifolia* provided protection to liver damage induced by administration of carbon tetrachloride in mice, rats, and rabbits.
- The decoction of *T. cordifolia* showed anti-inflammatory activity on carrageenin induced hind pawedema in rats.

Hepato-protective Activity:

- A study of hepato-protective activity of *T. cordifolia* on Kupffer cell function using carbon clearance test as a parameter showed significant improvement in kupffer cell function and a trend towards normalization.



Tinospora cordifolia appears to improve surgical outcome, in patient with malignant obstructive jaundice by strengthening the host defenses. Thus the *Ayurvedic* use of the plant in liver ailments is justified although the Active principle is yet to be isolated and identified.

Anti-stress Activity:

- The ethanolic extract of *T. cordifolia* exhibited significant anti stress activity at 100 ml/kg compared with diazepam at 2.5mg/kg. The ethanolic extract of *Tinospora cordifolia* at a dose 100 mg/kg was shown to induce a marked protective action against 8 hr restraint stress induced ulcerization.
- Sharma and Khosla have reported that the alcoholic extract of *T. cordifolia* roots possessed normalizing activity against stress induced changes in nor epinephrine, dopamine, 5-HT and 5 hydroxyindoleacetic acid levels of experimental rats.

Anti-histaminic Activity:

- *T. cordifolia* stem extract significantly decreased bronchospasm induced by 5 % histamine aerosol in Guinea pig and permeability in mice. It also reduced the no. of disrupted mast cell in rats.

Therapeutic Evaluation

A composite herbal drug containing *Tinospora cordifolia*, *Withania somnifera*, *Myristica fragrans*, *Eclipta alba*, *Bergenia ligulata*, *Asparagus racemosus* and *Tribulus terrestris* has been found to be efficacious in 30 patients of calculi. It has been reported that the calculi were discharged through urine as calcium carbonate or calcium oxalate crystals within 15-30 days. Other symptoms associated with calculi were also relieved of.

A compound preparation composed of *Cinnamomum tamala*, *Aegle marmelos*, *Gymnema sylvestre*, *Pterocarpus marsupium*, *Azadirachta indica*, *Tinospora cordifolia* and *Trigonella foenum-graecum* was tried in 20 patients of diabetes. Dose was determined on the basis of conditions of patients as 2 capsules t.d.s. to insulin dependent cases, 2 capsules b.d. to moderate cases and 1 capsule t.d.s. to mild diabetes for at least 3 weeks. It was concluded that the drug provides a total beneficial therapy in all types of diabetes and tends to increase insulin secretion from islets of pancreas.

A compound proprietary medicine containing *Mucuna pruriens* (seeds), *Tinospora cordifolia* (stem), *Withania somnifera* (stem), *Glycyrrhiza glabra* (stem), *Myristica fragrans* (fruit) and *Tribulus terrestris* (fruit) was administered orally (2 tablets b.d.) to 56 patients of sexual dysfunction for 4 weeks. An excellent improvement in erection, duration of coitus and ejaculation and post-coital satisfaction has been reported. In another trial sixty cases with specific sexual problems were treated with the same medicine in doses of 2 tablets twice a day and its effects on sexual performance of two third cases showed subjective improvement ranging from 25% to 100%. The remaining one third were refractory to the treatment.

Efficacy of a proprietary herbal preparation consisting of *Eugenia jambolana*, *Tinospora cordifolia*, *Pterocarpus marsupium*, *Ficus glomerata*, *Momordica charantia* and *Occimum sanctum* was evaluated on 28 cases of persistent post prandial hyperglycaemia. After 12 weeks of treatment a persistent fall in fasting and post prandial blood glucose levels was recorded.

A clinical trial was taken on 25 patients of type II diabetes to study the adjuvant effect of a herbo-mineral proprietary preparation in which *T. cordifolia* was one of the constituents. The drug contained 19 ingredients in which 13 were minerals and 6 were herbal. The drug was administered in the doses of 1-2 tablet t.d.s. in addition to the regular sulphonylureas over a period of 6 weeks. The herbo-mineral preparation showed improvement in glycaemic parameters, viz., fasting blood sugar levels, post lunch blood sugar levels and Fructosamine levels. It also improved fasting and post prandial hyperglycaemic control. This indicates that the proprietary medicine is useful adjuvant in poorly controlled type- II diabetes.

In a clinical trial 20 patients of infective hepatitis were treated with tablets prepared from stem of *T. cordifolia*. Four tablets (500 mg. each) were administered thrice daily with fresh water for 4 weeks. The majority of the cases i.e. 15 cases (75 %) were cured and 5 cases (25 %) were improved.

34 cases suffering from *amavata* (rheumatoid arthritis) were treated with *Suddha guggulu* and *Guduchyadi kwatha* for 6 weeks at Regional Center, CCRAS, Jaipur. The cases were assessed weekly and clinical observations made by the physicians. The results noted after 6 weeks showed that 27 cases had marked relief and 4 cases moderate relief.

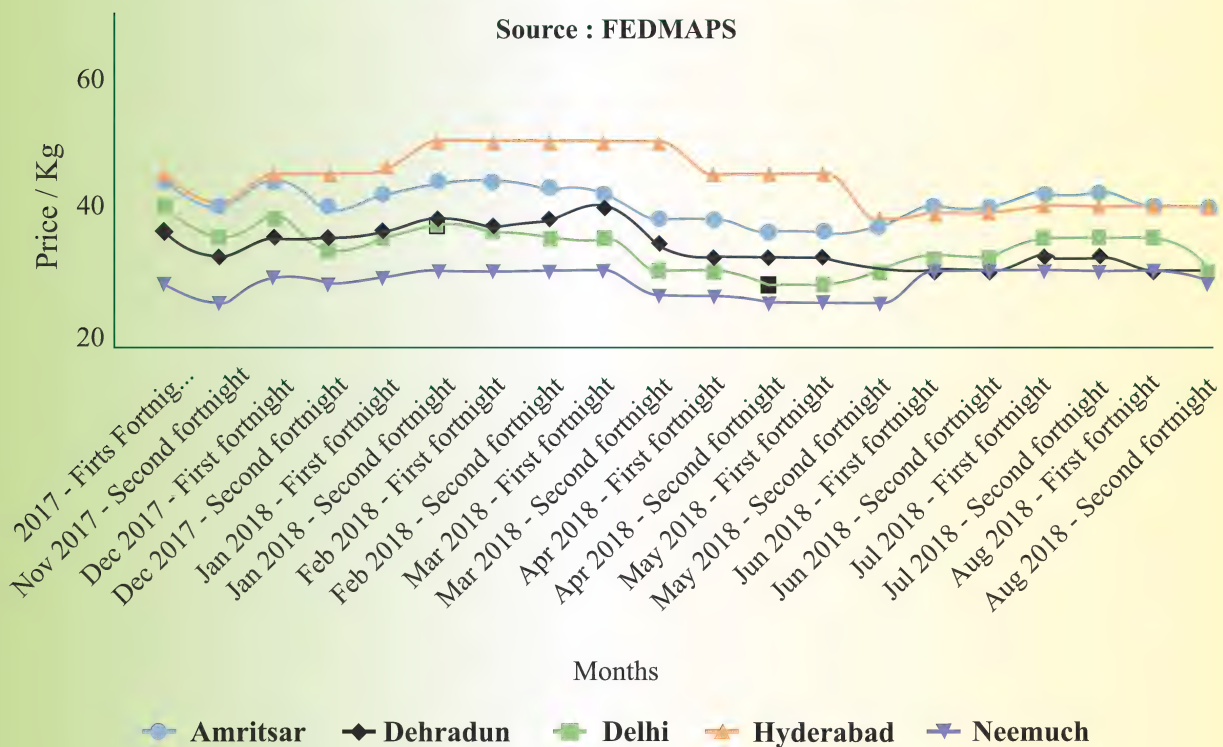


8. TRADE AND COMMERCE

- **Annual Trade of *Tinospora cordifolia* is:** 1000-2000 M.T. (Source: Medicinal Plants in India: An assessment of their demand and supply by Goraya and Ved, 2017)
- **Average Market Price of last 6 months:** *Tinospora cordifolia* (Dry Stem) – 34.54 rs/kg (Source: Collected by FEDMAPS – Federation of Medicinal and Aromatic Plants Stakeholders)

Price trend of a commodity in markets

Source : FEDMAPS



Market price Graph of Tinospora Codrifolia from November, 2017 to August, 2018 for markets Amritsar, Dehradun, Delhi, Hyderabad and Neemuch respectively taken from the following website: <http://e-charak.in/>

9. SUBSTITUTES AND ADULTERANTS

The commonest species of *Tinospora* with which *T. cordifolia* is likely to be substituted or adulterated are *T. sinensis* (Lour.) Merr. and *T. crispa* (Linn.) Miers ex Hook. f. & Th. The extract of *Guduchi* (*Guduchi sattva*) is adulterated with powder/ flour of potato/ sweet potato/ arrowroot / banana.

10. PROPAGATION AND CULTIVATION

The plant is sometimes cultivated as ornamental and is easily propagated by stem cuttings. It is perfectly suited to and grows well in almost any type of soil and under varying climatic conditions. It is specially trained to grow on Neem tree; thereby it is supposed to possess more medicinal virtue. It can also be grown by sowing seeds in monsoon, but the growth of seedlings is very slow as compared to plants grown by cuttings.

Climate and Soil:

The plant grows in subtropical and tropical climate. Light medium sandy loam soil rich in organic matter, and with adequate drainage, is suitable for its cultivation. It does not tolerate high rainfall or waterlogged conditions.

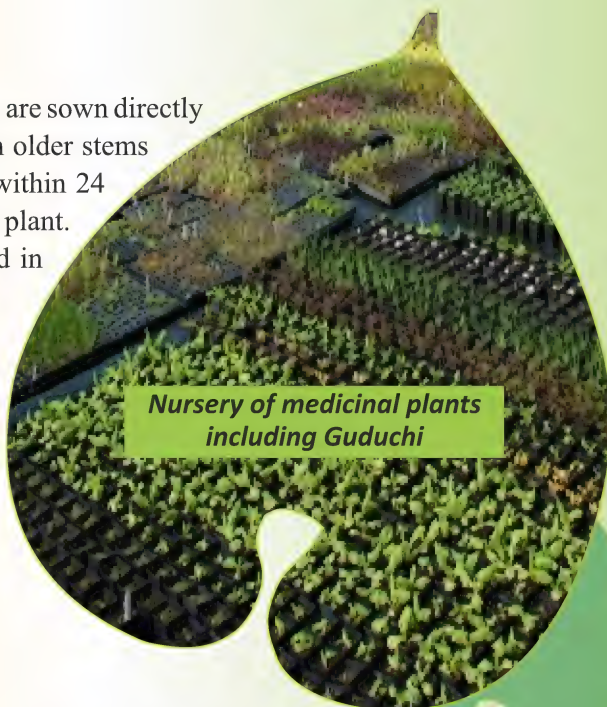
Propagation Material:

Stem cuttings are the best planting material for raising commercial crop. The cuttings can be obtained from mother plants in June–July. The plant can also be raised using seeds. Seeds take almost more than double the time to mature and yield the same quantity of drug.

Agro-techniques

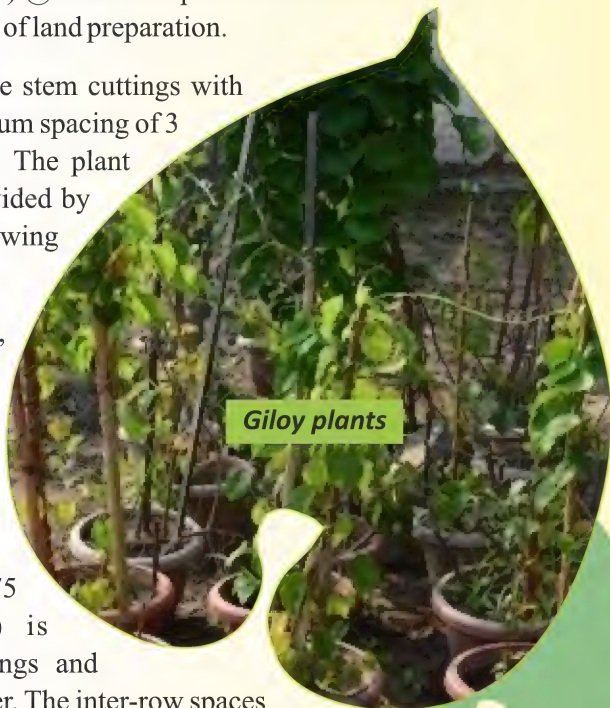
Nursery Technique:

- **Raising propagules :** The stem cuttings are sown directly in the field. Cuttings are obtained from older stems with nodes. Cuttings should be sown within 24 hours of their removal from the mother plant. Meanwhile, they should be half-dipped in water vertically.
- **Propagule rate and pretreatment :** About 2500 cuttings are required for plantation in 1 hectare of land. No specific treatment is required before sowing.



Planting in the Field

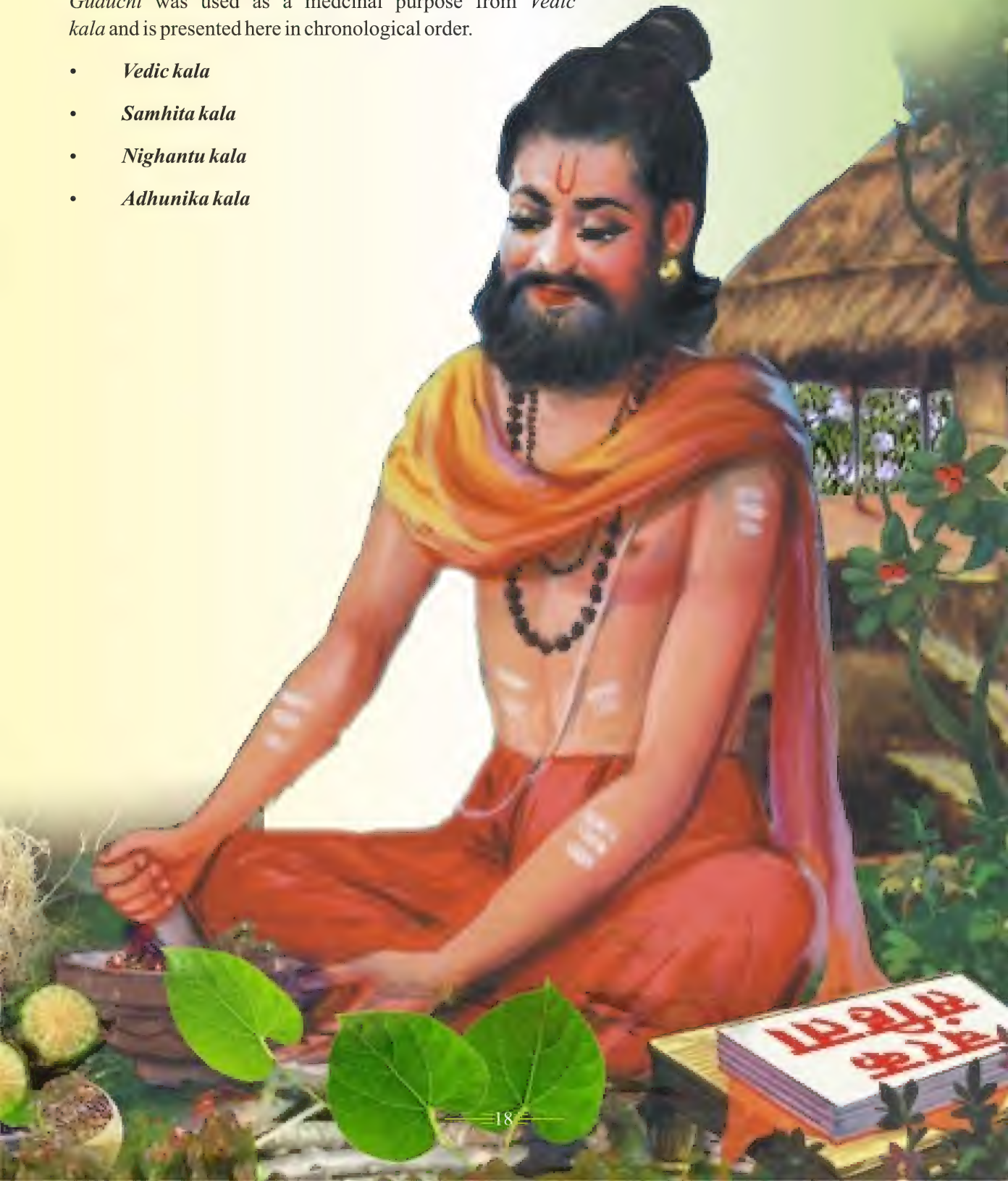
- **Land preparation and fertilizer application :** The land is ploughed, harrowed, and made weed-free. A basal dose of FYM (farmyard manure) @ 10 tonnes per hectare and half dose of nitrogen (75 kg) are applied at the time of land preparation.
- **Transplanting and optimum spacing :** The stem cuttings with nodes are sown directly in the field. An optimum spacing of 3 m × 3 m is recommended for better yield. The plant requires support to grow, which can be provided by raising wooden stakes or trellis. Already growing shrubs or trees can also support the plant.
- **Intercropping System :** Being a large twiner, it needs a host to twine and covers the host in a very short period. If the stem cuttings with aerial roots are thrown over trees, they start growing and strike roots in the ground.
- **Interculture and maintenance practices:**
Follow-up dose of 10 tonnes of FYM with 75 kg nitrogen (20% nitrogen content) is recommended. About two to three weedings and hoeings are required for good growth of twiner. The inter-row spaces between plants should be kept weed-free by frequent weeding and hoeing, as the plants may get suppressed by weeds, especially during early stages of growth.
- **Irrigation practices :** The crop is grown under rain-fed conditions. However, occasional irrigation during extremes of cold and hot weather may help the crop survive adverse conditions.
- **Disease and pest control :** No serious insect pest infestation or disease has been reported in this crop.



11. AMRITAIN AYURVEDA

Guduchi was used as a medicinal purpose from *Vedic kala* and is presented here in chronological order.

- *Vedic kala*
- *Samhita kala*
- *Nighantu kala*
- *Adhunika kala*



Vedic Kala:

In *Atharvaveda*, *Sayanai* defined about the traditional practice in which *Guduchi* was used to avoid snakes and scorpions.

Nighantu kala:

The main purpose of *Nighantus* is that which gives a comprehensive knowledge from all aspects of a particular subject, especially plants through synonyms.

Nighantu Kala was the platinum period for the development of the *Dravya Guna*. The era of *Nighantu* has provided the evidence of systematic & scientific understanding of the drug. In this period the drugs were explained with their synonyms, *Rasa Panchaka* and their utility in different disease. The descriptions regarding actions and indications of *Guduchi* have been mentioned in various *Nighantus* are as follows:

- *Ashtanga Nighantu: (Vahatacharya 8th Century A.D.)*
- *Dhanvantari Nighantuix: (Mahendra bhogika 10-13th Century A.D.)*
- *Nighantu Shesha: (Hemchandra suri 11th Century A.D.)*
- *Sodhala Nighantu: (Sodhala 12th Century A.D.)*
- *Madanpal Nighantu: (Madanpal 14th Century A.D.)*
- *Kaiyadeva Nighantu : (Kaiyadeva 15 Century A.D.)*
- *Raj Nighantu: (Pandit Narhari 15th Century A.D.)*
- *Bhavaprakasha Nighantu : (Bhavamishra 16th Century A.D.)*
- *Saligrama Nighantu : (Lala Saligrama Vaishya 19th Century A.D.):*

Adhunika Kala:

- *Abhidhana Ratnamala: (Acharya P.V.Sharma 20th Century A.D.)*
- *Shankara Nighantu : (Pt. Shankardatta Gaur 20th Century A.D.)*
- *Nighantu Adarsha: (Bapalal Vaidhya 20th Century A.D.)*



CLASSIFICATION:

TABLE: Showing Category of *Guduchi* according to their usage and actions in different *Ayurvedic* texts.

<i>Samhita / Nighantu</i>	<i>Ganas / Varga</i>
<i>Charaka Samhita</i>	<i>Sandhaniya, Triphighna, Sthanyashodana, Snehopaga, Trishnanigrahana, Dahaprashamana</i>
<i>Sushruta Samhita</i>	<i>Aragwadadi, Shyamadi, Patoladi, Kakolyadi, Guduchyadi, Vallipanchamoola</i>
<i>Ashtanga Hridaya</i>	<i>Tiktavarga, Patoladigana, Guduchyadi, Aragwadadigana</i>
<i>Bhavaprakesha Nighantu</i>	<i>Guduchyadi Varga</i>
<i>Dhanwantari Nighantu</i>	<i>Guduchyadi Varga</i>
<i>Raja Nighantu</i>	<i>Guduchyadi Varga</i>
<i>Kaiyadeva Nighantu</i>	<i>Aushadi Varga</i>
<i>Nighantu Aadarsha</i>	<i>Guduchyadi Varga</i>
<i>Shodala Nighantu</i>	<i>Guduchyadi Varga</i>
<i>Madanpal Nighantu</i>	<i>Abhayadi Varga</i>
<i>Pirya Nighantu</i>	<i>Pippalyadi Varga</i>

Types of Guduchi:

Samhita has not mentioned about the varieties of *Guduchi*, where as *Mahendra Bhogika* of *Dhanvantari Nighantu* has identified two the varieties of *Guduchi* the Botanical identification of which are-

1. *Guduchi- Tinospora cordifolia* (willd)
2. *Kandodbhava Guduchi- Tinospora sinensis* or *Tinospora malabarica*
3. *Padma Guduchi- Mention by Gangadhara*

Ayurvedic properties:

- **Rasa** – *Tikta, Kashaya*
- **Guna** – *Guru, Snigdha*
- **Veerya** – *Ushna*
- **Vipaka** – *Madhura*
- **Doshaghната** – *Tridoshashamaka*

- **Rogaghnata:** Kushtha, Vatarakta, Netraroga, Trishna, Daha, Chhardi, Aruchi, Agnimandya, Shoola, Yakridvikara, Kamala, Amlapitta, Pravahika, Atisara, Raktatisara, Grahani, Krimi, Arsha, Hriddaurbalya, Pleehavridhi, Vastishotha, Raktavikara, Amavata, Pandu, Shwasa, Kasa, Shukradaurbalya, Prameha, Madhumeha, Mootrakrichchra, Kushtha, Visarpa, Twagroga, Phiranga, Jwara, Vishamajwara, Jeernajwara.
- **Karma:** Vedanasthapana, Kushthaghna, Trishnanigrahana, Chhardinigrahana, Deepana, Pachana, Pittasaraka, Anulomana, Sangrahi, Krimighna, Hridya, Raktashodhaka, Raktavardhaka, Kaphaghna, Vrishya, Balya, Pramehahara, Mootrajanana, Jwaraghna, Dahaprashamana, Rasayana.

Doses:

- Decoction : 50-100 ml
- Powder : 3-6 gm
- Sattva (starch from roots and stems): 1-2 gm
- Juice (Swarasa): 5-10 ml

FORMULATIONS AND PREPARATIONS

Guduchyadi churna, Guduchyadi kvatha, Guduchyadi lauha, Amritarishta, Guduchi taila, Guduchyadi taila, Sarvajwarahara lauha, Dashamoolarishta, Kaishore guggulu, Pathyadi kvatha, Sanjivani vati, Kantakari avaleha, Chyavanaprasha, Guduchi satva, Amritottara kvatha churna, Chinnodbhavadi kvatha churna, Brihat guduchi taila, Stanyashodhana kashaya churna, Panchanimba churna, Brihanmarichadya taila, Guduchi ghrita, Amritaguggulu, Amritashtaka churna, Bhadramustadi kvatha.

- **Churna** - Rasayan churna, Sudarsana churna
- **Kwatha** - Guduchyadi kwatha, Punarnavastaka kwatha
- **Arista** - Amritarista
- **Ghrita** - Guduchi Ghrita, Amritadi Ghrita, Panchatikta Ghrita
- **Taila** - Guduchyadi taila
- **Vati** - Samsamni vati, Chandraprabha vati
- **Lauha** - Guduchyadi lauha
- **Rasa-ausadhi** - Gandhak rasayan, Chandrakala rasa



12. AMRITA IN UNANI SYSTEM OF MEDICINE

Gilo consists of dried, matured pieces of stem of *Tinospora cordifolia* (Wild) Miers. of Menispermaceae family.



Usage of Gilo as per Unani Medicinal System

Unani Name : *Gilo*

Action and Uses:

Stem: *Daf-e-Humma, Musaffi-e-Dam, Muhallil-e-Warm, Mudir-e-Baul, Muqawwi-e-Badan, Qabiz Khafeef, Qatile-Kirm-e-Shikam, Mushtahi, Muwallid-e-Mani, Daf-e-Sozish-e-Qalb, Kabid and Meda.*

Use: *In Tap-e-Muharriqa, Tap-e-Diq, Kharish, Busoor Damameel, Aatishak, Sozak, Waj-ul Mafasil, Ishaal-e-Muzmin, Ishal-e-Damavi.*

Dose :

5 to 10 g (Dry Stem Powder)

Therapeutic Use:

Humma, Ishal, Zaheer, Deedan-e-Ama.

Important Formulation:

Sufoof-e-Satt-e-Gilo, Sufoof-e-Satt-e-Gilo-Sartani



Grown up Giloy plant

13. AMRITA IN SIDDHA SYSTEM OF MEDICINE

SEENTHIL

SEENTHIL, *Tinospora cordifolia* (Willd.) Miers. (Fam. Menispermaceae), a perennial climber found throughout tropical India; drug is collected during summer preferably in the month of May; drug is used in fresh form also.

Properties and Actions

<i>Cuvai</i>	:	<i>Kaippu</i>
<i>Gunam</i>	:	<i>Ilaku</i>
<i>Virium</i>	:	<i>Veppam</i>
<i>Pirivu</i>	:	<i>Karppu</i>
<i>Ceykai</i>	:	<i>Ciruneriperukki, Kayakarpamakki, Kamamperukki, Muraiveppakarri, Pacittitundi, Ullazalarri, Uramakki, Udartere, Veppamudakki</i>

Therapeutic Uses:

Sori (Itchiness), *Suram* (fever), *Peenisam* (sinusitis), *Kuttam* (skin diseases), *Kuruthiazhal* (hypertension)

Important Formulations:

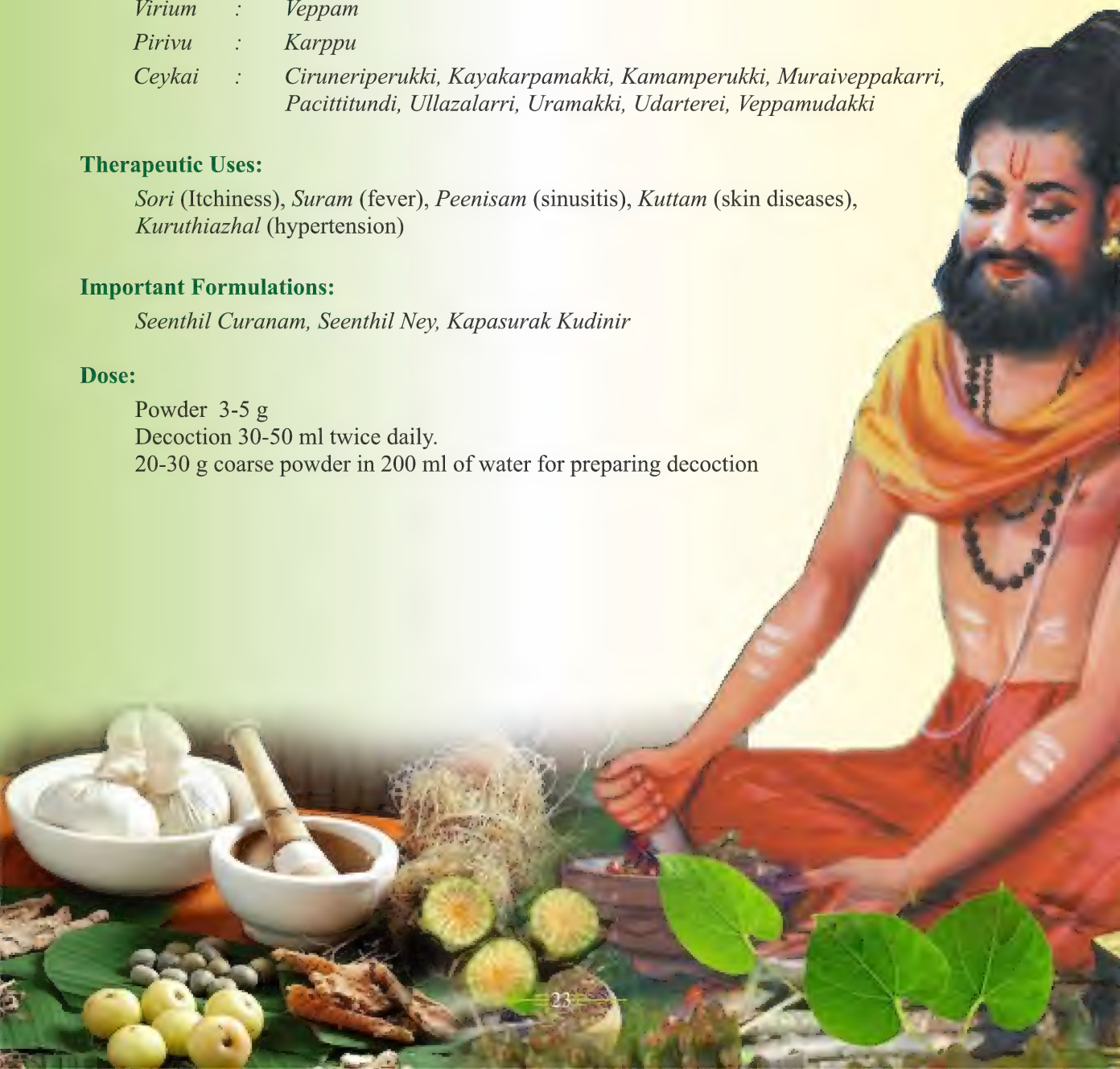
Seenthil Curanam, Seenthil Ney, Kapasurak Kudinir

Dose:

Powder 3-5 g

Decoction 30-50 ml twice daily.

20-30 g coarse powder in 200 ml of water for preparing decoction



14.AMRITAIN HOMOEOPATHY

TINOSPORA CORDIFOLIA

(Tino.spo.)

BOTANICAL NAME	:	<i>Tinospora cordifolia</i> Miers.
FAMILY	:	Menispermaceae
COMMON NAMES	:	<i>Gulantha, Giloe, Gaduchi.</i>
PART USED	:	Stem and root.
DISTRIBUTION	:	Throughout warm parts of India.
IDENTIFICATION	:	Evaporate 25 mL mother tincture on water bath to remove alcohol. Extract the residue with 3x20 mL chloroform and concentrate the chloroform extract to 2 mL. Carry out TLC on pre coated silica gel aluminium plate 60F-254, 0.25 mm thickness, Merck, using chloroform: methanol (19:1 v/v) as mobile phase.

PREPARATION :

(a) Mother Tincture Drug Strength 1/10

<i>Tinospora Cordifolia</i> , moist magma containing solids 100 g and plant moisture 488 ml	588 g
Purified Water	69 ml
Strong Alcohol	480 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies:

2x and higher with Dispensing Alcohol



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What is e-Charak

- A virtual market place for medicinal plants
- A platform for buyers & sellers to interact
- A virtual showcase to display goods & services
- For knowledge access and sharing



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- Individuals - Farmers, traders, collectors
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- Institutions – NGOs, Cooperatives
- Anybody who has interest in medicinal plants

What items can be posted

- Planting materials
- Medicinal plants/Herbs
- Herbal extract
- Value added products



Why Use e-Charak

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- Get to know the value of one's goods
- Get information on source for planting materials
- Get rightful share of benefits
- Make better decisions - what & how much to produce





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